

CLAIMS

1. A method of treating an irradiated food product comprising packaging a food product in a modified atmosphere and removing oxidants from the modified atmosphere, such that oxidation of the food product is impeded for a predetermined period of time after packaging the food product.

2. The method of claim 1, wherein packaging a food product comprises packaging the food product in a multi-layer film, wherein the multi-layer film includes an inner oxygen-permeable layer and an outer oxygen-impermeable layer, and wherein removing oxidants from the modified atmosphere comprises packaging the food product using a substantially oxidant-free modified atmosphere.

3. The method of claim 2 further comprising removing the outer oxygen-impermeable layer after irradiating the food product.

4. The method of claim 1, wherein packaging the food product further comprises applying an oxidant-reactive chemical substance to the food product.

5. The method of claim 4, wherein applying an oxidant-reactive chemical substance comprises applying a chemical selected from the group consisting of a metal chelating agent and an antioxidant.

6. The method of claim 5, wherein applying a metal chelating agent comprises applying a chelating agent selected from the group consisting of a phosphate and ascorbic acid.

7. The method of claim 5, wherein applying an antioxidant comprises applying an antioxidant selected from the group consisting of butylated hydroxyanisole and butylated hydroxytoluene.

5 8. A method of treating a food product comprising:
packaging a food product in a substantially oxidant-free modified
atmosphere using a multi-layer film, wherein the multi-layer film includes an inner
oxygen-permeable layer and an outer oxygen-impermeable layer; and
10 irradiating the food product.

9. The method of claim 8 further comprising removing the outer
oxygen-impermeable layer after irradiating the food product.

10 10. The method of claim 8, wherein the inner oxygen-permeable layer
15 comprises a film having an oxygen transmission rate of at least about 100 cc/m²/24
hours.

11. The method of claim 8, wherein the outer oxygen-impermeable
20 layer comprises an oxygen transmission rate of no more than about 100 cc/m²/24
hours.

12. The method of claim 8, wherein the substantially oxidant-free
modified atmosphere comprises a gas selected from the group consisting of
nitrogen, carbon dioxide, argon, krypton, xenon, neon and mixtures thereof.

25 13. The method of claim 8, wherein irradiating the food product
comprises subjecting the food product to radiation selected from the group
consisting of gamma ray, x-ray and electron beam.

14. The method of claim 13, wherein irradiating the food product comprises substantially reducing populations of microorganisms selected from the group consisting of bacteria, yeast and molds that are present on the food product.

5 15. The method of claim 8, wherein packaging the food product comprises placing the food product in a tray and sealing the substantially oxidant-free modified atmosphere within the tray using the multi-layer film.

10 16. The process of claim 8, wherein the food product comprises a food selected from the group consisting of meat, poultry, fish, fresh produce and spices.

15 17. A method of treating a food product comprising:
packaging a food product in a modified atmosphere; and
complexing oxidants and irradiating the food product, such that oxidation of the food product is impeded for a predetermined period of time after irradiating the food product.

20 18. The method of claim 17, wherein complexing oxidants comprises applying an oxidant-reactive chemical substance to the food product.

19. The method of claim 18, wherein applying an oxidant-reactive chemical substance comprises applying a chemical selected from the group consisting of a metal chelating agent and an antioxidant.

25 20. The method of claim 19, wherein applying a metal chelating agent comprises applying a chelating agent selected from the group consisting of a phosphate and ascorbic acid.

30 21. The method of claim 19, wherein applying an antioxidant comprises applying an antioxidant selected from the group consisting of butylated hydroxyanisole and butylated hydroxytoluene.

22. A method of treating a food product comprising:
applying an oxidant-reactive chemical substance to the food
product;
5 packaging a food product in a substantially oxidant-free modified
atmosphere; and
irradiating the food product.

23. The method of claim 22, wherein packaging the food product
10 comprises packaging the food product in a multi-layer film, wherein the multi-
layer film includes an inner oxygen-permeable layer and an outer oxygen-
impermeable layer.

24. The method of claim 23, wherein the inner oxygen-permeable layer
15 comprises a film having an oxygen transmission rate of at least about 100 cc/m²/24
hours.

25. The method of claim 23, wherein the outer oxygen-impermeable
20 layer comprises an oxygen transmission rate of no more than about 100 cc/m²/24
hours.

26. The method of claim 23 further comprising removing the outer
oxygen-impermeable layer after irradiating the food product.

27. The method of claim 22, wherein packaging the food product
25 further comprises applying an oxidant-reactive chemical substance to the food
product.

28. The method of claim 27, wherein applying an oxidant-reactive
30 chemical substance comprises applying a chemical selected from the group
consisting of a metal chelating agent and an antioxidant.

29. The method of claim 28, wherein applying a metal chelating agent comprises applying a chelating agent selected from the group consisting of a phosphate and ascorbic acid.

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30. The method of claim 28, wherein applying an antioxidant comprises applying an antioxidant selected from the group consisting of butylated hydroxyanisole and butylated hydroxytoluene.

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31. The method of claim 22, wherein the substantially oxidant-free modified atmosphere comprises a gas selected from the group consisting of nitrogen, carbon dioxide, argon, krypton, xenon, neon and mixtures thereof.

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32. The method of claim 22, wherein packaging the food product comprises placing the food product in a tray and sealing the substantially oxidant-free modified atmosphere within the tray using a multi-layer film.